INDIANA STATE DEPARTMENT OF HEALTH
Report on Fireworks-Related Injuries
(Period of May 2003 – December 2004)

Legislation passed in 2003 by the Indiana General Assembly (HEA 1131) requires physicians, hospitals, and outpatient surgery centers to report all injuries resulting from fireworks or pyrotechnics to the Indiana State Department of Health through 2004. This report summarizes the data compiled during the reporting requirement period of time. Note that Table 3 in the current report provides a comparison of 2003 and 2004 data.

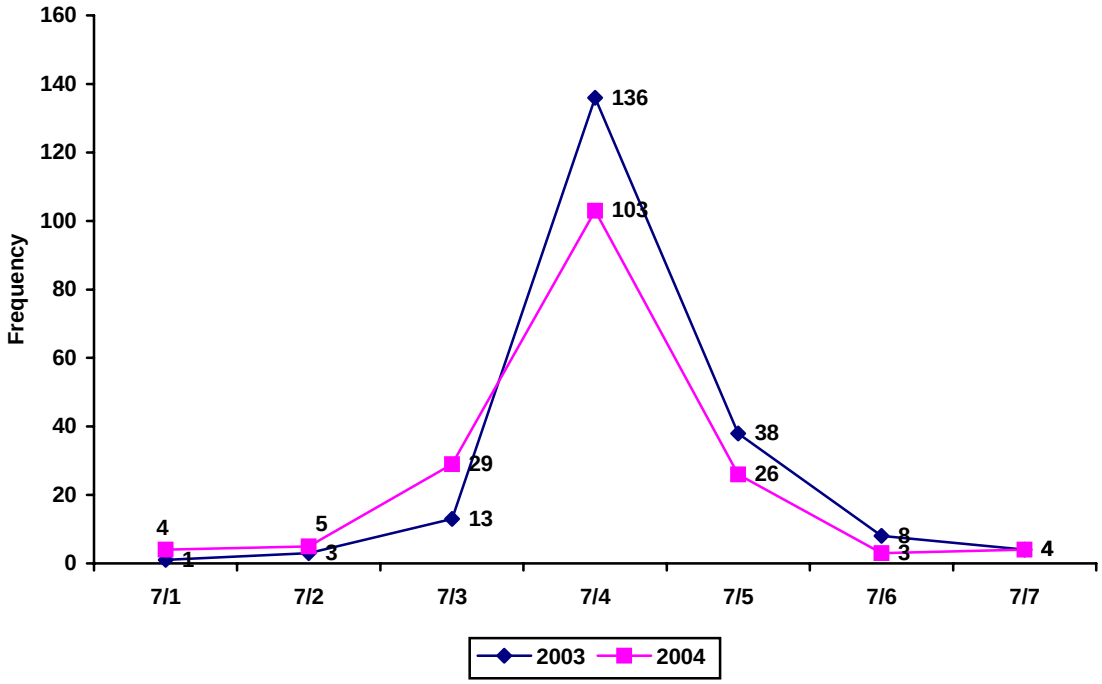
HIGHLIGHTS

- **As of December 13, 2004, there were 494 unduplicated cases reported to ISDH.**
- **Fifty-three percent of all fireworks-related injuries reported involved children and adolescents, who represent 26 percent of the population in Indiana.**
- **Seventy-one percent of cases reported burn injuries, with burns of the hands being the most common type of injury.**
- **One out of every five injuries reported involved the eyes, with 81 percent of those with eye injuries not using any method of eye protection.**
- **Fourteen percent of injured persons required either hospital admission or specialized care for burns or eye injuries.**
- **Sparklers, rockets and firecrackers were associated with 63 percent of all injuries reported.**
- **Fireworks use on private property accounted for more than three-fourths of the injuries reported.**

FIREWORKS-RELATED INJURIES-DEMOGRAPHIC SUMMARY

- Seventy-four percent (367) of the reported injuries involved males and 26 percent (127) involved females.
- The majority of the injuries were among the White race (85 percent); Black/African Americans accounted for 9 percent of injuries.
- The median age of those injured was 18 years (average=21 years; range=6 weeks to 74 years).
- Seventy-two percent (356) of the injuries occurred during the holiday 4-day peak period of July 3rd-6th.

Figure 1: Fireworks-Related Injuries by Date (July 1-7) and Year.



Sparklers, rockets, and firecrackers accounted for 63 percent of the injuries (Table 1). Many other types of fireworks causing injury were reported, including a quarter stick of dynamite, smoke bombs, spinners, small poppers, roman candles, and fountains. Although one-fourth (123) of the reports noted that the injury resulted from mishandling fireworks, 37 percent (181) reported that the injury resulted from fireworks malfunction or an errant path of a rocket.

Seventy-one percent (353) of the cases experienced injury from burns. Although there was variability in the severity of the burns, the majority sustained either a 1st or 2nd degree burn. Twenty-two percent (76) reported only a 1st degree burn, 49 percent (173) reported a 2nd degree burn, and 18 percent (62) reported a combination of both. Twelve people reported 3rd degree burns. Other types of injuries included contusions/lacerations/abrasions (108 cases), penetrating foreign body/missiles (32 cases), puncture wounds (16 cases) and sprains/fractures (7 cases). Fifty-four (340) percent of all injuries involved the hands or eyes, although injuries to many parts of the body were reported (Table 2).

Among the 89 percent (440) who reported the location of the activity that resulted in injuries, 61 percent (269) occurred at the injured person's private home, yard, or

property. A friend/neighbor/relatives home or property was involved for 25 percent (108); public or school property was noted for 10 percent (42).

Although most reports did not provide information on alcohol consumption, 13 percent (64) stated that alcohol was imbibed related to the injury and 45 of these noted alcohol use within three hours of the injury. Thirty-nine total cases reported alcohol use by other people at the scene.

Fifteen percent (75) of all people injured were bystanders. Among those injured who were less than 18 years of age, fifty-seven percent (n=246) of the injuries happened while in the presence of an adult.

Table 1: Frequency of Type of Fireworks Involved in Injury, All Injuries.

Type of Fireworks / Pyrotechnics	Frequency	Percent
Rockets (i.e., bottle rockets)	113	22.9%
Sparkler	109	22.1%
Firecrackers	87	17.6%
Aerial Devices	34	6.9%
Pyrotechnics*	16	3.2%
Twister / "Jumping Jacks"	11	2.2%
Homemade, altered devices	5	1.0%
Lightning Gunpowder	2	0.4%
Unspecified / Unknown / Other	117	23.7%
Total	**494**	**100%**

***Reported to the State Fire Marshal's office for further investigation.**

Table 2. Frequency of Body Part Injured, All Injuries.

Body Part Involved**	Frequency**	Percent of Injured Persons**	Percent of All Injuries**
Hand	210	42.5%	33.3%
Eye	130	26.3%	20.6%
Face/Ears/Head	92	18.6%	14.6%
Leg	80	16.2%	12.7%
Arm	61	12.3%	9.7%
Trunk	49	9.9%	7.8%
Other	9	1.8%	1.4%
Total	**631**	**127.7%**	**100.0%**

****Not mutually exclusive, some cases received injuries to multiple body parts.**

SUMMARY 2003-2004 DATA

For the 494 cases of fireworks-related injury that comprise this report, 65 percent (319) occurred during the weekend of July 4th, including 48 percent (239) of injuries that took place on Independence Day. While those injured ranged in age from 6 weeks to 74 years, children and adolescents composed 53 percent of the reported cases. According to the 2003 U.S. Census population estimates for Indiana, persons under 18 years of age represent 26 percent of the population. Adults were present 57 percent of the time for injuries reported in children and adolescents less than 18 years old. Males were involved in 74 percent of all cases reported, which is a common finding for many traumatic injuries. The racial distribution of those injured was similar to that of the population in Indiana.

As expected, burns were the most frequent type of injury, involving 71 percent (353) of all reported cases and 56 percent of all injuries. While the hands were the part of the body most commonly injured (one-third of all injuries), injuries to the eye (21 percent) were also frequent, with the great majority (81 percent) of those with eye injuries reporting no method of eye protection in use. Bystanders were injured in 15 percent (75) of reported cases. Hospital admission was needed for 4.5 percent of those injured, and an additional 9.3 percent requiring specialized care for either burn injuries or eye injuries. There were no deaths reported to the ISDH related to fireworks injuries during the time period of this report.

When the location of the activity using fireworks was identified, 76 percent (377) of cases reported occurred at private home, yard, or property (self-owned or friend, neighbor or relative). The type of fireworks involved in injuries varied somewhat by age, with sparklers causing the most injuries in young children, rockets and firecrackers involved in adolescents, and a fairly equal distribution of these three types of fireworks affecting injured adults.

Mishandling, malfunction, or errant path of fireworks was the most frequent mechanism reported for fireworks-associated injury, accounting for 62 percent (304) of all those injured. Although whether alcohol was used was not stated in 87 percent of the reported cases, alcohol use occurred at the scene of activities affecting injured persons of all age groups. Alcohol use was reported by 26 percent of all adults injured.

Table 3: Comparison of 2003 and 2004 Data

Category	2003	2004
Demographics	**n=261**	**n=233**
Median Age/Range	18 (0-74 yrs)	18 (0-72yrs)
Children/Adolescents	53%	52%
Males	73%	76%
Females	27%	24%
White	84%	87%
Black or African American	10%	8%
Injury Type/Body Part Injured		
Burns	76%	67%
Hand Injuries	34%	32%
Eye Injuries	17%	25%
Injury Circumstances		
Injured on Private Property	83%	89%
Cases with Eye Injury and No Eye Protection	82%	88%
Children Injured with Adults Present	64%	50%
Received Specialized Care for Burn or Eye Injuries	8%	19%
Hospitalized	3%	6%
Fireworks Circumstances		
Injuries from Sparklers, Rocket, and Firecrackers	62%	64%
Injuries from Mishandling Firework	27%	23%
Errant Path or Malfunctioning Firework	36%	37%

Source: ISDH, Injury Prevention Program

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APPENDIX
(Reporting Period: May 2003 to December 2004)

This section of the report describes the characteristics of the reported injuries for three specific age groups – children, adolescents, and adults. Please refer to the figures below which demonstrates the age-related distribution of the types of injuries, body parts involved, and the types of fireworks involved.

CHILDREN: LESS THAN ONE THROUGH ELEVEN YEARS OF AGE

There were 145 (101 male and 44 female) injuries reported in children. The types of fireworks mainly resulting in injury included sparklers (57 cases), rockets (29 cases) and firecrackers (20 cases). Eighty-one percent (117) sustained burns in this age group.

The most frequently reported injured body part was the hands (48 cases). Injuries to other body parts included the leg (34 cases), eye (32 cases), face/ears/head (24 cases), arm (23 cases), and trunk (12 cases). None of those with eye injuries were using eye protection. The majority of these injuries (68 percent or 99) happened in the presence of an adult. Ten reports noted alcohol use at the scene at the time of the injury. Nineteen percent (28) of the injured children were bystanders. The majority (87 percent or 126) of those injured were evaluated in hospital emergency departments or provider offices and then released to home. Ten children were transferred or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers) and three children were hospitalized for injuries sustained.

ADOLESCENTS: TWELVE THROUGH EIGHTEEN YEARS OF AGE

Among adolescents, there were 115 fireworks-related injuries, involving 92 males and 23 females. The most frequent type of fireworks involved among this age group were rockets (36 injuries), followed by firecrackers (27 injuries), sparklers (9 injuries). Pyrotechnics was reported as the cause of 4 injuries. Burns (66 percent) and the category of contusion/laceration/abrasion (22 percent) were the most frequent types of injuries reported.

The hand was the most frequently reported body part injured (49 cases). Injuries to other parts of the body included the eye (42 cases), face/ears/head (20 cases), arm (14 cases), leg (12 cases) and trunk (8 cases). Among those with eye injuries, none were wearing eye protection, although three people were wearing contact lenses at the time of the injury. One person required surgery to the eye as a result of the injury sustained. Six cases required hospitalization and eleven were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers).

Among those cases less than age 18 years, 42 injuries occurred while in the presence of an adult. Fourteen of the injured were bystanders. Although the most frequently reported mechanism of injury involved mishandling of fireworks, 36 percent (41) reported the injury resulted from malfunctioning or errant paths of the fireworks.

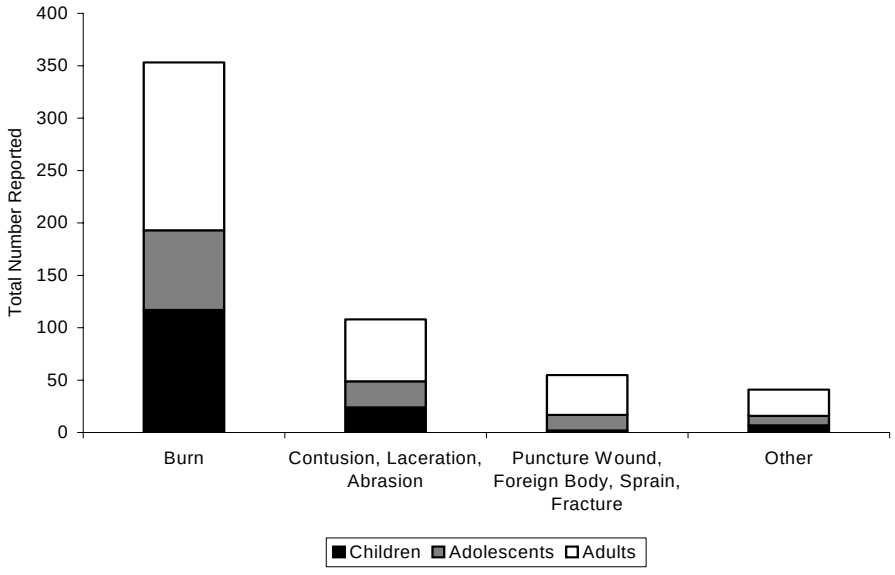
ADULTS: NINETEEN YEARS OF AGE AND OLDER

There were 234 people (47 percent of all cases) age nineteen years and older injured during this reporting period (174 males and 60 females). The types of fireworks primarily involved in the injuries were rockets (48 cases), sparklers (43 cases), and firecrackers (40 cases). Pyrotechnics was reported as the cause of 12 injuries. Sixty-eight percent (160) of the adults experienced burn injuries.

Hand injuries were reported 113 times. Injuries also included the eye (56 cases), face/ears/head (48 cases each), leg (34 cases) trunk (29 cases), and arm (24 cases). For those with eye injuries, only four wore eyeglasses or safety glasses. Thirteen cases were admitted to hospitals. Twenty-five cases were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers).

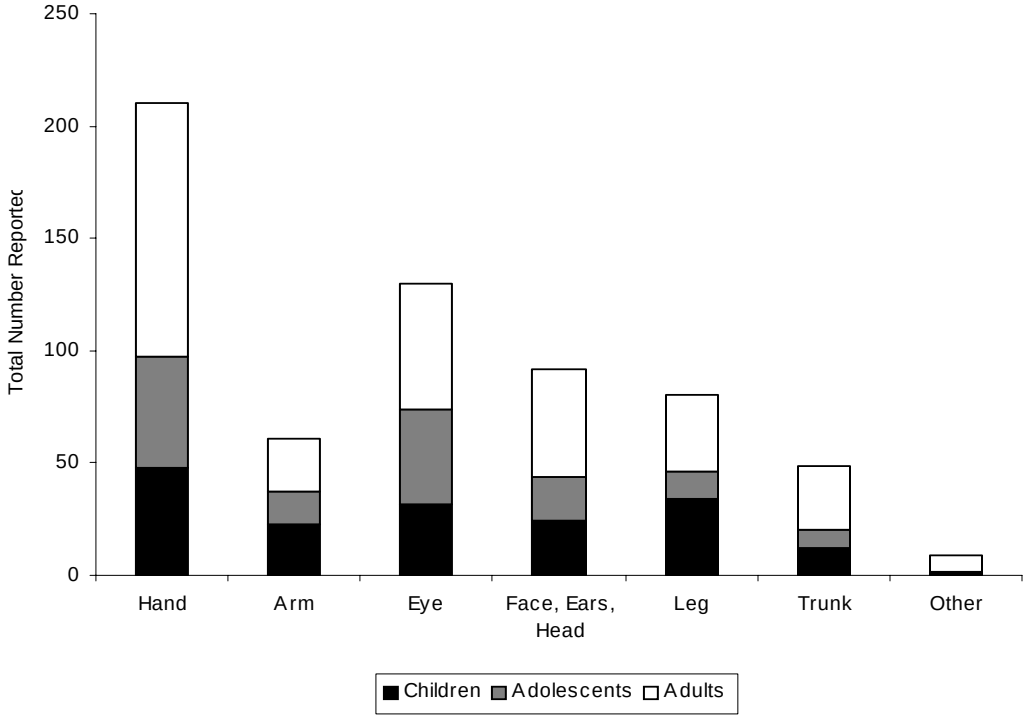
The use of alcohol was reported by 26 percent (61) of injured adults and 43 imbibed alcohol within three hours of the injury. Fourteen percent (33) of the injured cases were bystanders. Forty-six percent (107) of the cases reported an injury resulting from malfunctioning fireworks or an errant path of rockets, while 48 noted that mishandling of fireworks resulting in the injury.

Figure 1: Type of Injury Involved in Fireworks, Indiana 2003-2004



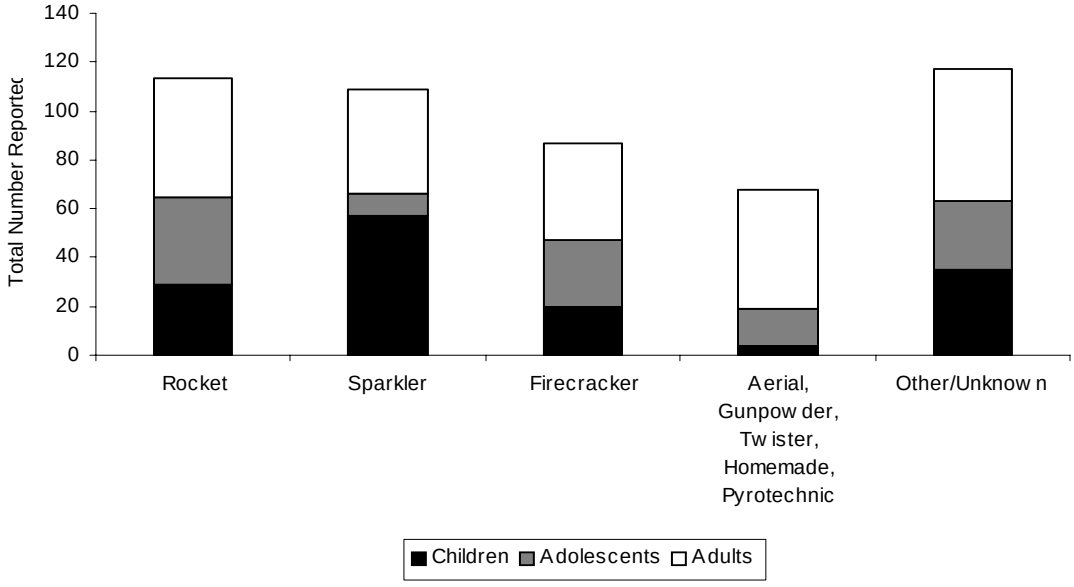
Source: ISDH, Injury Prevention Program

Figure 2: Body Parts Involved in Fireworks-Related Injuries, Indiana 2003-2004



Source: ISDH, Injury Prevention Program

Figure 3: Type of Firework Involved in Injury, Indiana 2003-2004



Source: ISDH, Injury Prevention Program